

**LOCKOUT/TAGOUT
AND ENERGIZING PROCEDURE
FOR ATR X ARC AND Y ARC POWER SUPPLIES**

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1. Purpose and Scope

- 1.1 The purpose of this procedure is to provide instructions in how to perform the lock out and tag out or energizing of the ATR X Arc and Y Arc power supplies (XYPS).
- 1.2 There are two Arc Power Supplies: one for the X Arc and one for the Y Arc. The maximum output is 350 VDC at 3200 ADC. Both are located in building 1000P.
- 1.3 This procedure is only to be performed by the persons qualified, as described in paragraph 2.

2. Responsibilities

- 2.1 ONLY persons with current training in BOTH *general* LOTO procedures, and LOTO procedures *specific* to the XYPS will be authorized to perform the steps in this procedure.

3. Prerequisites

- 3.1 Personnel performing this procedure shall be authorized by the ATR power supply engineer.
- 3.2 The authorization shall be renewed yearly.
- 3.3 Authorized persons will be trained with:
 - 3.3.1 A discussion on electrical safety.
 - 3.3.2 A demonstration on the proper procedure for LOTO of the new disconnect switches in the 1000P pump room.

4. Precautions

WARNING: ***FAILURE TO IMPLEMENT THIS PROCEDURE AND SEAPPM 1.5.1 COULD CAUSE FATAL OR SERIOUS INJURIES TO PERSONNEL.***

4.1 Notification

Notify personnel in the area of the action to be taken, in accordance with BNL LOTO policy.

5. Procedure

5.1 Companion Documents

5.1.1 These procedures are ONLY to be performed by authorized personnel as defined in section 2.2, and only with the XYPS in a state where LOTO can be safely performed, as indicated by the current operational procedure for the ATR X Arc and Y Arc Power Supplies.

5.1.2 The requirements of SEAPPM 1.5.1 Logout/Tagout Requirements, shall be followed.

5.2 Y-ARC or X-ARC P.S. ENERGIZING PROCEDURE

5.2.1 Follow figures 1 and 2 for this procedure. Figure 2 is a photo of the new disconnect switches in 1000P. The input comes from the transformers in the 1000P substation. The output of the switches goes to the rectifiers of the XPS and YPS p.s.'s

5.2.2 To energize the power supplies the first step is to turn on the UPS control power for the power supply and then for the contactor in the 1000P substation. For the X ARC p.s. control power turn on breaker #11 in the UPS panel labeled 1000P-PP1. For the Y-ARC p.s. control power turn on breaker #5 in the UPS panel labeled 1000P-PP1.

5.2.3 Next turn on the control power for the contactors. For the X-ARC Contactor turn on breaker #9 in the UPS panel labeled 1000P-PP1. For the Y-ARC Contactor turn on breaker #3 in the UPS panel labeled 1000P-PP1. There is a white light on the p.s. labeled "Contactor Control Power". This light will light when the contactor control power circuit breaker in panel 1000P-PP1 is energized and the p.s. is in Standby. Put the p.s. in LOCAL.

5.2.4 To unlock the p.s. disconnect switch in the 1000P pump room start at the back door of the power supply (see figure 1). Lock the kirklock on the back door of the power supply so key #1 releases and take key#1 from the back door kirklock to the kirklock on the front door.

5.2.5 Lock the kirklock on the front door by turning keys #1 and #2. Key #2 will now release.

- 5.2.6 Take key #2 out of the kirklock on the front door of the p.s. and bring it over to the 480volt disconnect located behind the Inverpower 15kw and 25kw p.s.'s.
- 5.2.7 Place key #2 in this 480v disconnect switch labeled "Y-Arc 480v disconnect" or "X-Arc 480v disconnect". Turn keys #2 and #3 in the 480v disconnect. Key #3 will now release. Take key #3 out of the 480v disconnect switch. Key #3 will be used to unlock the kirklock on the disconnect switch in the 1000P pump room.
- 5.2.8 Energize the 480v disconnect switch.
- 5.2.9 Energize the black breaker switch labeled "**480 breaker switch**" at the bottom right side of the 1MW power supply. This is the blower power for the power supply
- 5.2.10 Go into the 1000P pump room with key #3. Another person should stay in front of the p.s. and make sure it is in the OFF state and in local. You shall also check that the voltmeter reads zero volts on all 3 phases. Look for the disconnect switch labeled "SXARC" or "SYARC". See figure 2 for a photo of the 2 disconnect switches.

WARNINGS

To throw the disconnect switches in the 1000P pump room you should be wearing safety glasses and a natural fiber shirt and natural fiber pants.

The contactor in the substation must be open before throwing the SXARC or SYARC disconnect in the 1000P pump room. Make sure the XARC or YARC p.s. is in the OFF state and the voltmeter on the front reads zero volts on all 3 phases.

- 5.2.11 Go to the disconnect switch. Unlock the kirklock with key#3.
- 5.2.12 Turn on the disconnect switch.

5.3 Y-ARC or X-ARC P.S. DEENERGIZING PROCEDURE

- 5.3.1 Follow figures 1 and 2 for this procedure. Figure 2 is a photo of the new disconnect switches in 1000P. The input comes from the transformers in the 1000P substation. The output of the switches goes to the rectifiers of the XPS and YPS p.s.'s
- 5.3.2 Make sure the p.s. is in the OFF state before locking it out. If the green OFF light is lit the p.s. is OFF. Look at the AC voltmeter. Check that all three line voltages read zero volts by moving the AC voltmeter selector switch. Put the p.s. in LOCAL. **One person shall stand in front of the p.s. and make sure that no one comes and tries to turn the p.s. on while the other person goes to turn off the disconnect switch in the 1000P pump room.**
- 5.3.3 Deenergize the black breaker switch labeled “**480 breaker switch**” at the bottom right side of the 1MW-2 power supply.

WARNINGS

To throw the disconnect switches in the 1000P pump room you should be wearing safety glasses and a natural fiber shirt and natural fiber pants.

The contactor in the substation must be open before throwing the SXARC or SYARC disconnect in the 1000P pump room. Make sure the XARC or YARC p.s. is in the OFF state and the voltmeter on the front reads zero volts on all 3 phases.

- 5.3.4 Go into the 1000P pump room to lock out the disconnect switch (see figure 1).
- 5.3.5 Turn off the disconnect switch in the 1000P pump room.
- 5.3.6 Take key #3 over to the 480 volt disconnect located behind the Inverpower 15kw and 25kw p.s.'s. This 480v disconnect switch is labeled “Y-Arc 480v disconnect” or “X-Arc 480v disconnect”. Deenergize the 480v disconnect (see figure 1).

- 5.3.9 Put key #3 into the kirklock on the 480v disconnect and turn both keys #2 and #3 so that the kirklock is now locking out the 480v disconnect switch as in the diagram. Key #2 will now release from the kirklock. Hold onto this key.
- 5.3.10 Go to UPS circuit breaker panel 1000P-PP1 and deenergize the 120v circuit breaker #3 for the Y-Arc Contactor Control Power or #9 for the X-Arc Contactor Control Power. There is a white light on the p.s. labeled "Contactor Control Power". This light will go off when the contactor control power circuit breaker in panel 1000P-PP1 is de-energized and the p.s. is in Standby.
- 5.3.11 In the same UPS panel you can now turn off the control power to the X -ARC and Y-ARC power supplies. In panel 1000P-PP1 turn off breaker #11 for the X-ARC power supply control power. Turn off breaker #5 for the Y-ARC power supply control power. Once the UPS power has been de-energized the OFF light on the power supply will go Off.
- 5.3.12 Take key #2 over to the front door of the Y-Arc p.s. or X-Arc p.s. and insert it into the #2 slot. Turn both keys #1 and #2 so that the front door kirklock unlocks the front door. Key #1 will now release.
- 5.3.13 Now that the front door is unlocked check that all three line voltages read zero volts. Measure across TB2-5 to TB2-6 with a Wiggins. This is the line voltage a to b (Vab). Measure across TB2-6 to TB2-7 with a Wiggins. This is the line voltage b to c (Vbc). Measure across TB2-5 to TB2-7 with a Wiggins. This is the line voltage a to c (Vac). Also measure from TB2-5 to ground, then TB2-6 to ground and then TB2-7 to ground. If all of these measurements read zero volts then the disconnect switch is open.
- 5.3.14 Take key #1 out of the front door kirklock. The front door can now be opened to service the power supply.
- 5.3.15 Key #1 can be used to open the back door or can be taken somewhere else and locked up so that the power supply cannot be energized.

6. Documentation

- 6.1 LOTO Logbook.

7. References

- 7.1 SEAPPM 1.5.1 Logout/Tagout Requirements.

8. Attachments

1. Figure 1

2 Figure 2

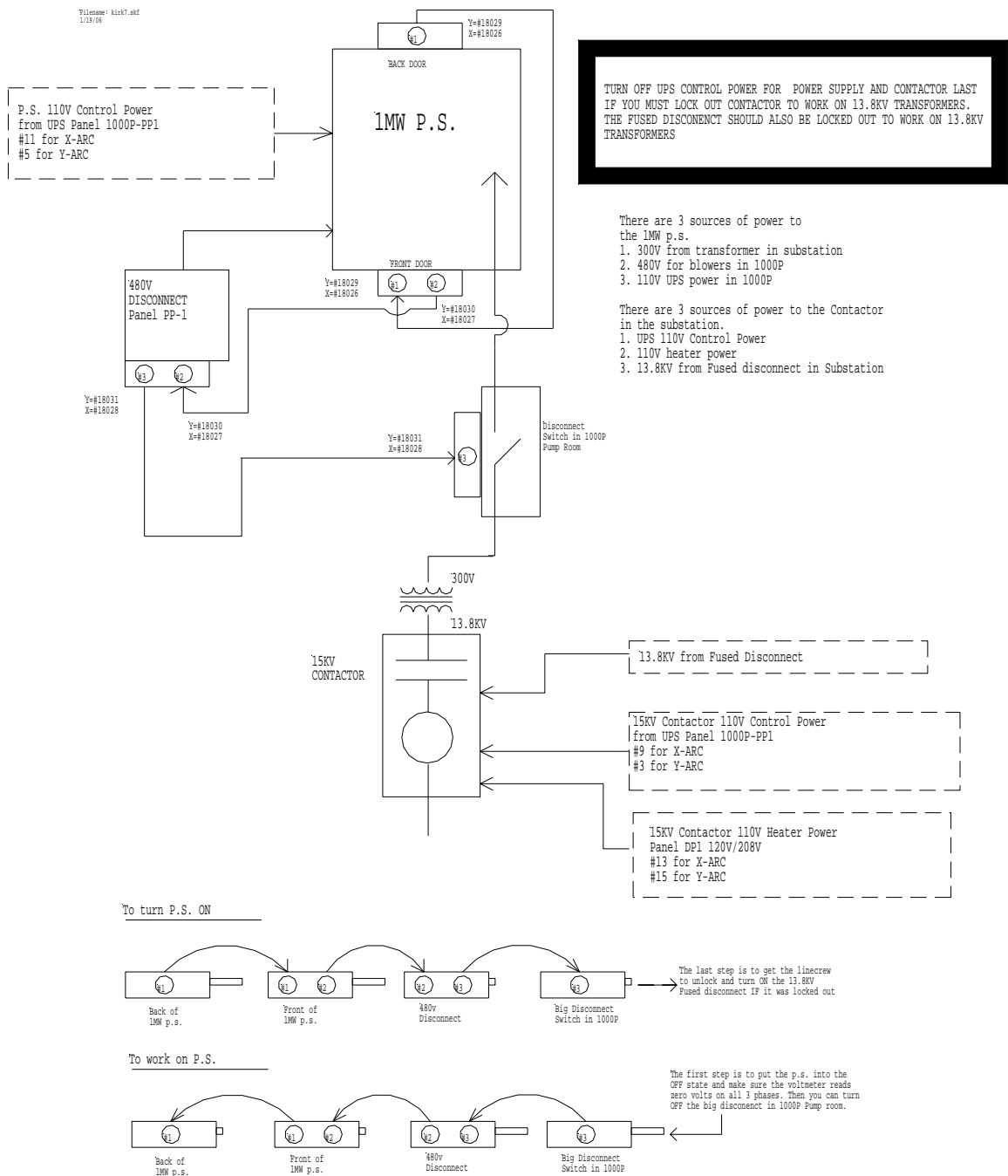


Figure 1



Figure 2